CLAIMS

1. A method for generating an output signal that comprises:

receiving samples of a source signal having spectral content;

applying a primary transform to overlapping segments of the samples to generate a plurality of sets of spectral coefficients, wherein each set of spectral coefficients has time-domain aliasing artifacts and represents the spectral content of a respective source signal segment for a set of frequencies;

obtaining a plurality of spectral coefficients representing the same frequency in the set of frequencies from the plurality of sets of spectral coefficients and assembling the plurality of spectral coefficients into one or more blocks of spectral coefficients, wherein the number of spectral coefficients that are assembled in each of the one or more blocks is adapted in response to a block-length control signal;

applying a secondary transform to the one or more blocks of spectral coefficients to generate one or more sets of hybrid-transform coefficients, wherein the length of the secondary transform that is applied to each of the one or more blocks of spectral coefficients is adapted in response to the block-length control signal; and

assembling information representing the one or more sets of hybrid-transform coefficients and the block-length control signal into the output signal.

2. The method according to claim 1 wherein the primary transform is a Modified Discrete Cosine Transform and the secondary transform is a Discrete Cosine Transform that is applied to blocks of spectral coefficients that do not overlap one another.

3. The method according to claim 1 that comprises:

generating a measure of similarity for spectral component magnitudes within a plurality of sets of spectral components; and

generating the block-length control signal in response to the measure of similarity.

4. The method according to any one of claims 1 through 3 that comprises:

analyzing samples of the source signal to generate a segment-length control signal; and

applying an analysis window function to a segment of samples of the source signal, wherein shape or length of the analysis window function is adapted in response to the segment-length control signal.

5. The method according to claim 4 wherein the primary transform has a set of basis functions and the method comprises adapting the set of basis functions in response to the segment-length control signal.

6. A method for generating an output signal that comprises:

receiving an input signal that represents spectral content of a source signal;

obtaining one or more sets of hybrid-transform coefficients and a block-length control signal from the input signal;

applying an inverse secondary transform to the one or more sets of hybrid-transform coefficients to generate one or more blocks of spectral coefficients representing spectral content of the source signal for the same frequency in a set of frequencies, wherein the length of the inverse secondary transform that is applied to the sets of hybrid-transform coefficients is adapted in response to the block-length control signal;

assembling the spectral coefficients into sets of spectral coefficients, wherein each set of spectral coefficients has time-domain aliasing artifacts and represents the spectral content of a segment of the source signal for all frequencies in the set of frequencies;

applying an inverse primary transform to the sets of spectral coefficients to generate output signal segments that correspond to segments of the source signal, wherein the inverse primary transform substantially cancels the time-domain aliasing artifacts.

7. The method according to claim 6 wherein the inverse primary transform is an Inverse Modified Discrete Cosine Transform and the inverse secondary transform is an Inverse Discrete Cosine Transform that is applied to sets of hytbrid-transform coefficients representing blocks of spectral coefficients that do not overlap one another.

8. The method according to claim 6 or 7 that comprises:

obtaining a segment-length control signal from the input signal; and

applying a synthesis window function to an output signal segment, wherein shape or length of the synthesis window function is adapted in response to the segment-length control signal.

9. The method according to claim 8 wherein the inverse primary transform has a set of basis functions and the method comprises adapting the set of basis functions in response to the segment-length control signal.

10. An apparatus for generating an output signal that comprises:

(a) an input terminal;

(b) an output terminal; and

(c) signal processing circuitry coupled to the input terminal and the output terminal, wherein the signal processing circuitry is adapted to:

receive samples of a source signal having spectral content from the input terminal;

apply a primary transform to overlapping segments of the samples to generate a plurality of sets of spectral coefficients, wherein each set of spectral coefficients has time-domain aliasing artifacts and represents the spectral content of a respective source signal segment for a set of frequencies;

obtain a plurality of spectral coefficients representing the same frequency in the set of frequencies from the plurality of sets of spectral coefficients and assemble the plurality of spectral coefficients into one or more blocks of spectral coefficients, wherein the number of spectral

coefficients that are assembled in each of the one or more blocks is adapted in response to a block-length control signal;

apply a secondary transform to the one or more blocks of spectral coefficients to generate one or more sets of hybrid-transform coefficients, wherein the length of the secondary transform that is applied to each of the one or more blocks of spectral coefficients is adapted in response to the block-length control signal; and

assemble information representing the one or more sets of hybrid-transform coefficients and the block-length control signal into the output signal that is sent to the output terminal.

11. The apparatus according to claim 10 wherein the primary transform is a Modified Discrete Cosine Transform and the secondary transform is a Discrete Cosine Transform that is applied to blocks of spectral coefficients that do not overlap one another.

12. The apparatus according to claim 10 wherein the signal processing circuitry is adapted to:

generate a measure of similarity for spectral component magnitudes within a plurality of sets of spectral components; and

generate the block-length control signal in response to the measure of similarity.

13. The apparatus according to any one of claims 10 through 12 wherein the signal processing circuitry is adapted to:

analyze samples of the source signal to generate a segment-length control signal; and

apply an analysis window function to a segment of samples of the source signal, wherein shape or length of the analysis window function is adapted in response to the segment-length control signal.

14. The apparatus according to claim 13 wherein the primary transform has a set of basis functions and the signal processing circuitry adapts the set of basis functions in response to the segment-length control signal.

15. An apparatus for generating an output signal that comprises:

(a) an input terminal;

(b) an output terminal; and

(c) signal processing circuitry coupled to the input terminal and the output terminal, wherein the signal processing circuitry is adapted to:

receive an input signal that represents spectral content of a source signal from the intput terminal;

obtain one or more sets of hybrid-transform coefficients and a block-length control signal from the input signal;

apply an inverse secondary transform to the one or more sets of hybrid-transform coefficients to generate one or more blocks of spectral coefficients representing spectral content of the source signal for the same frequency in a set of frequencies, wherein the length of the inverse secondary transform that is applied to the sets of hybrid-transform coefficients is adapted in response to the block-length control signal;

assemble the spectral coefficients into sets of spectral coefficients, wherein each set of spectral coefficients has time-domain aliasing artifacts and represents the spectral content of a segment of the source signal for all frequencies in the set of frequencies; and

apply an inverse primary transform to the sets of spectral coefficients to generate output signal segments that correspond to segments of the source signal, wherein the inverse primary transform substantially cancels the time-domain aliasing artifacts and the output signal segments are sent to the output terminal.

16. The apparatus according to claim 15 wherein the inverse primary transform is an Inverse Modified Discrete Cosine Transform and the inverse secondary transform is an

Inverse Discrete Cosine Transform that is applied to sets of hytbrid-transform coefficients representing blocks of spectral coefficients that do not overlap one another.

17. The apparatus according to claim 15 or 16 wherein the signal processing circuitry is adapted to:

obtain a segment-length control signal from the input signal; and

apply a synthesis window function to an output signal segment, wherein shape or length of the synthesis window function is adapted in response to the segment-length control signal.

18. The apparatus according to claim 17 wherein the inverse primary transform has a set of basis functions and the signal processing circuitry adapts the set of basis functions in response to the segment-length control signal.

19. A method for generating an output signal that comprises:

receiving samples of a source signal having spectral content;

applying a primary transform to overlapping segments of the samples to generate a plurality of sets of spectral coefficients, wherein each set of spectral coefficients has time-domain aliasing artifacts and represents the spectral content of a respective source signal segment for a set of frequencies;

obtaining a plurality of spectral coefficients representing the same frequency in the set of frequencies from the plurality of sets of spectral coefficients and assembling the plurality of spectral coefficients into one or more blocks of spectral coefficients, wherein the number of spectral coefficients that are assembled in each of the one or more blocks is adapted in response to a block-length control signal;

applying a secondary transform to the one or more blocks of spectral coefficients to generate one or more sets of hybrid-transform coefficients, wherein the length of the secondary transform that is applied to each of the one or more blocks of spectral coefficients is adapted in response to the block-length control signal; and

assembling information representing the one or more sets of hybrid-transform coefficients and the block-length control signal into the output signal.

20. The method according to claim 19 wherein the primary transform is a Modified Discrete Cosine Transform and the secondary transform is a Discrete Cosine Transform that is applied to blocks of spectral coefficients that do not overlap one another.

21. The method according to claim 19 or 20 that comprises:

analyzing samples of the source signal to generate a segment-length control signal; and

applying an analysis window function to a segment of samples of the source signal, wherein shape or length of the analysis window function is adapted in response to the segment-length control signal.

22. A method for generating an output signal that comprises:

receiving an input signal that represents spectral content of a source signal;

obtaining one or more sets of hybrid-transform coefficients and a block-length control signal from the input signal;

applying an inverse secondary transform to the one or more sets of hybrid-transform coefficients to generate one or more blocks of spectral coefficients representing spectral content of the source signal for the same frequency in a set of frequencies, wherein the length of the inverse secondary transform that is applied to the sets of hybrid-transform coefficients is adapted in response to the block-length control signal;

assembling the spectral coefficients into sets of spectral coefficients, wherein each set of spectral coefficients has time-domain aliasing artifacts and represents the spectral content of a segment of the source signal for all frequencies in the set of frequencies;

applying an inverse primary transform to the sets of spectral coefficients to generate output signal segments that correspond to segments of the source signal, wherein the inverse primary transform substantially cancels the time-domain aliasing artifacts.

23. The method according to claim 22 wherein the inverse primary transform is an Inverse Modified Discrete Cosine Transform and the inverse secondary transform is an Inverse Discrete Cosine Transform that is applied to sets of hytbrid-transform coefficients representing blocks of spectral coefficients that do not overlap one another.

24. The method according to claim 22 or 23 that comprises:

obtaining a segment-length control signal from the input signal; and

applying a synthesis window function to an output signal segment, wherein shape or length of the synthesis window function is adapted in response to the segment-length control signal.